Volunteer Lake Assessment Program Individual Lake Reports

LONG POND, PELHAM, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	1,142	**Max. Depth (m):**	7.6	**Flushing Rate (yr^{-1})**	1.5
Surface Area (Ac.):	121	**Mean Depth (m):**	3.2	**P Retention Coef:**	
Shore Length (m):	4,800	**Volume (m^3):**	1,559,000	**Elevation (ft):**	151

TROPHIC CLASSIFICATION

Year	Trophic class
1978	OLIGOTROPHIC
2007	MESOTROPHIC

KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the DRAFT 2014 305(b) report on the status of N.H. waters, and are based on data collected from 2004-2013. Detailed waterbody assessment and report card information can be found at www.des.nh.gov/organizations/divisions/water/wmb/swqa/index.htm

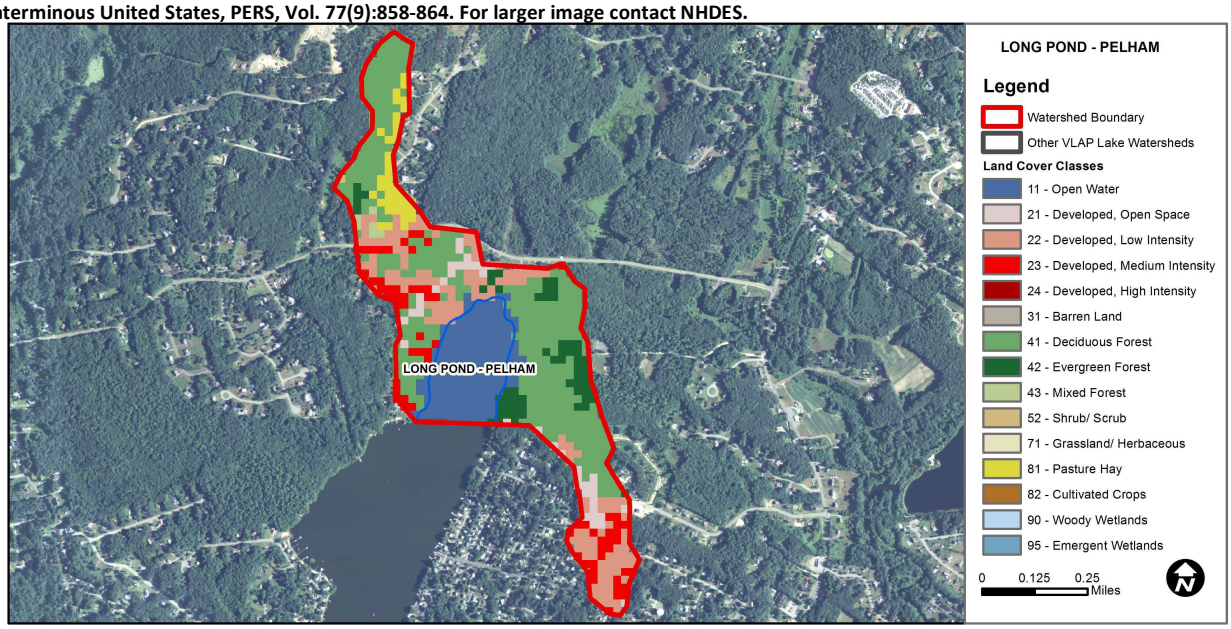
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	The calculated median is from 5 or more samples and is > indicator and the chlorophyll a indicator is exceeded.
	pH	Very Good	At least 10 samples with 0 exceedances of criteria.
	Oxygen, Dissolved	Cautionary	There are < 10 samples with 1 exceedance of criteria. More data needed.
	Dissolved oxygen satura	Cautionary	There are < 10 samples with 1 exceedance of criteria. More data needed.
	Chlorophyll-a	Slightly Bad	The calculated median is from 5 or more samples and is > indicator.
Primary Contact Recreation	Escherichia coli	Very Good	Where there are no geometric means, all bacteria samples are < 75% of the geometric mean. Where there are geometric means all single bacteria samples are < the SSMC and all geometric means are < geometric mean criteria.
	Cyanobacteria hepatoto	Slightly Bad	Cyanobacteria bloom(s).
	Chlorophyll-a	Slightly Bad	There are >10% of samples (minimum of 2), exceeding indicator.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

LONG POND - TOWN BEACH	Escherichia coli	Bad	There are >=1 exceedance(s) of the geometric mean and/or >=2 single sample criterion exceedances. One or more exceedance is >2X criteria.
LONG POND - TOWN BEACH	Cyanobacteria	Bad	Cyanobacteria bloom(s).

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	18	Barren Land	0	Grassland/Herbaceous	0
Developed-Open Space	4.6	Deciduous Forest	41.43	Pasture Hay	4.37
Developed-Low Intensity	16.3	Evergreen Forest	6.91	Cultivated Crops	0
Developed-Medium Intensity	7.83	Mixed Forest	0.69	Woody Wetlands	0
Developed-High Intensity	0	Shrub-Scrub	0.12	Emergent Wetlands	0

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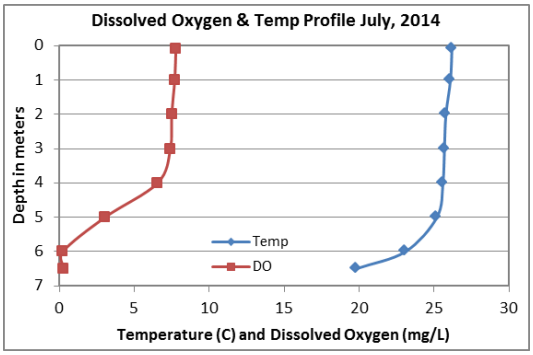
2014 Data Summary

Observations and Recommendations (*Refer to Table 1 and Historical Deep Spot Data Graphics*)

- **Chlorophyll-a:** Chlorophyll levels were elevated in July, much greater than the state median, and greater than 15.0 ug/L and indicative of an algal bloom. The phytoplankton sample indicated that cyanobacteria were the dominant algae in July. Visual inspection of historical data indicates variable chlorophyll levels since monitoring began.
- **Conductivity/Chloride:** Deep spot conductivity and chloride remained elevated and were much greater than the state medians. Visual inspection of historical data indicates relatively stable epilimnetic (upper water layer) conductivity since monitoring began.
- **Total Phosphorus:** Deep spot phosphorus was slightly elevated and greater than the state median, however epilimnetic phosphorus was the lowest measured since monitoring began. Visual inspection of historical data indicates variable epilimnetic phosphorus levels since monitoring began.
- **Transparency:** Transparency remained stable with that measured in 2013, however was less than (worse) the state median. Transparency improved greatly when phosphorus and algal growth was low, as seen in 2010. Visual inspection of historical data indicates variable transparency since monitoring began.
- **Turbidity:** Deep spot turbidity was slightly elevated likely due to the algal bloom that was occurring.
- **pH:** Deep spot pH was sufficient to support aquatic life and within the desirable range 6.5-8.0 units.
- **Dissolved Oxygen/Temp:** Dissolved oxygen levels in the hypolimnion decreased to zero in late July. Typically, when phosphorus levels decrease below 1.0 mg/L, phosphorus and organic compounds bound in lake sediments can be released into the water column, a process called internal loading.
- **Recommended Actions:** The pond's watershed is heavily urbanized and the poor water quality reflects that. As the percentage of impervious surfaces increases (paved roads, driveways, rooftops) with development, so does the volume of stormwater runoff entering the pond. Stormwater runoff carries pollutants and nutrients, such as phosphorus, into the pond which in turn contribute to elevated plant and algal growth, and low dissolved oxygen. Lake and watershed residents should be educated on ways to reduce stormwater runoff from their properties. Development of a watershed management plan is recommended as it would help to identify and quantify pollutant sources as well as recommend management strategies to reduce these. Additional information on watershed management plan development can be found at http://des.nh.gov/organization/divisions/water/wmb/was/index.htm.



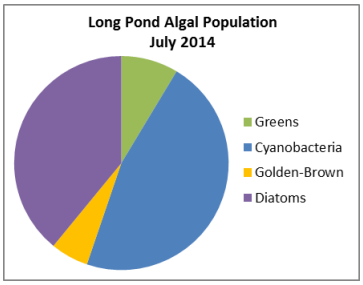


Table 1. 2014 Average Water Quality Data for LONG POND

Station Name	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	Total P ug/l	Trans. m		Turb. ntu	pH
						NVS	VS		
Epilimnion	23.1	15.41	80	362.0	15	2.00	2.28	3.25	7.37
Hypolimnion				362.0	16			3.01	7.07

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: > 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: between 6.5-8.0 (unless naturally occurring)

Historical Water Quality Trend Analysis

Parameter	Trend	Explanation	Parameter	Trend	Explanation
Conductivity	N/A	Ten consecutive years of data necessary for trend analysis.	Chlorophyll-a	N/A	Ten consecutive years of data necessary for trend analysis.
pH (epilimnion)	N/A	Ten consecutive years of data necessary for trend analysis.	Transparency	N/A	Ten consecutive years of data necessary for trend analysis.
			Phosphorus (epilimnion)	N/A	Ten consecutive years of data necessary for trend analysis.